EPA United States Environmental Protection Agency

Region 6 - Enforcement & Compliance Assurance Division

INSPECTION REPORT

Inspection Date(s):	01/31/2022-02/02/2022; 04/12/2022-04/13/2022	
Media Program:	Air	
Regulatory Program(s)	Title V CAA	
Company Name:	**Sasol Chemicals (USA) LLC**	
Facility Name:	**Sasol Chemicals Lake Charles Chemical Complex**	
Facility Physical Location:	2201 Old Spanish Trial	
(city, state, zip code)	Westlake, LA, 70669	
Mailing address:	2201 Old Spanish Trial	
(city, state, zip code)	Westlake, LA, 70669	
County/Parish:	Calcasieu	
Facility Phone Number	+1-337-494-5140	
Facility Contact:	Mary Allyson Leger	Environmental Manager
	Mary.idlett@us.sasol.com	
FRS Number:	110017418061	
Identification/Permit Number:	LDEQ AI 3271	
Media Identifier Number:	LA0000002201900003	
NAICS:	32511; 326112; 32619; 49311; 325120; 325110; 325199; 325180; 325188; 325199	
SIC:	2869	
Personnel participating in inspection:		
Justin Chen	ECD-AT	Inspector
Doreen Au	NEIC	Inspector
Andrew Mills	LDEQ	Inspector
EPA Lead Inspector Signature/Date	Chen, Justin Digitally signed by Chen, Justin Date: 2022.09.26 14:01:43 -05'00'	
	{Inspector name}	Date
Supervisor Signature/Date	JAMES LEATHERS Digitally signed by JAMES LEATHERS Date: 2022.09.26 14:17:29 -05'00'	
	{Supervisor name}	Date

Section I – INTRODUCTION

PURPOSE OF THE INSPECTION

EPA Region 6 inspector Justin Chen (J. Chen) and EPA's National Enforcement Investigations Center ("NEIC") inspector Doreen Au (D. Au) arrived at the Sasol Chemicals (USA) LLC Lake Charles Chemicals Complex ("Sasol Chemicals Complex") facility at 09:15 AM on January 31, 2022, for an unannounced inspection. We met with Mary Allyson Leger/environmental manager (referred to as Allyson from hence forth), and Matthew Todd/environmental specialist. D. Au and I presented credentials to Allyson Leger and informed her that this was an EPA inspection to determine compliance with the facility's Title V Air Permit and the Clean Air Act ("CAA"). The scope of the inspection is a partial compliance evaluation specifically focusing on the production and usage of ethylene oxide ("EO"). We informed Sasol staff that we planned to inspect facilities and review documents related to the EO units.

The EPA inspection team returned on April 12, 2022, in an announced continuation of the inspection with Louisiana Department of Environmental Quality ("LDEQ") inspector Andrew Mills. In this opening meeting we met with Allyson Leger/environmental manager, Matthew Todd/environmental specialist, and Philip Zachary/Ethylene Oxide Ethylene Glycol ("EO/EG") engineer. EPA Region 6 inspectors Ben Rosenthal and James Haynes also attended this opening meeting while on a separate inspection of the Sasol Chemicals Complex.

FACILITY DESCRIPTION

The Sasol Chemicals Complex is in Westlake, Louisiana near the Calcasieu River with an address of 2201 Old Spanish Trail, Westlake, Louisiana 70669. The facility was purchased by Sasol from Condea Vista assets in 2001. It operates 8,760 hours per year with approximately 700 full-time staff.

The facility's EO related units are the Ethylene Oxide/Ethylene Glycol ("EO/EG") unit and Ethoxylation Units ("ETO") 1, 2, 3, 4 and 5. The EO/EG and ETO Units 4 and 5 send their wastewater to the Louisiana Integrated Polyethylene Join Venture ("LIP JV"), which is a joint venture held between Sasol Chemicals and Lyondell Bassell that is located on the grounds of Sasol Chemicals Complex. The wastewater is sent to LIP JV's Wastewater Treatment Plant 2 ("WWTP2"). The wastewater streams from Sasol Chemical Complex are composed of oily process wastewater, non-oily process wastewater, and potentially contaminated storm water via the First Flush Tank and Storm Water Storage Tank (if contaminated). ETO 1, 2, and 3 wastewater is sent to Sasol's Activated Sludge Unit.

The EO/EG unit and ETO units operate under separate CAA Title V permits (two permits). The facility operates an EO Elevated Flare for the EO/EG Unit. ETO 1, 2, and 3 will send waste gas to a Vapor Combustor Unit ("VCU") Ground Flare as a primary flare and an Elevated Flare as a backup emergency flare, and ETO 4 and 5 have a separate ETO/Guerbet Elevated Flare.

Section II - OBSERVATIONS
Part 1 of Inspection (1/31/2022 – 2/2/2022)

On January 31, 2022, the EPA inspection team (referred to as "the inspectors" herein) conducted an unannounced inspection of the Sasol Chemicals Complex in Westlake, Louisiana. During the opening meeting with Sasol staff, it was explained to me and D. Au that on December 1st, 2020, a joint venture was opened between Sasol Chemicals and Lyondell Bassell which resulted in the creation of the LIP JV

from some parts formerly of the Sasol Chemicals Complex, including the Ethylene 2 plant, as well as new constructions. We were told that the LIP JV had its own air permits (held by Lyondell Bassell) and staff (who are employed by Lyondell Bassell) to manage its operations. Allyson Leger, Environmental Manager of Sasol Chemicals Complex, stated that the Sasol Chemical Complex, after the LIP JV split, maintained eleven (11) CAA Title V operating permits as well as three (3) Prevention of Significant Deterioration Permits ("PSD Permits"), and that LIP JV has five (5) CAA Title V operating permits and 1 PSD Permit. She then provided us the contact information of LIP JV Environmental Manager, Megan Leger. Allyson stated that the ethylene used for EO production at the Sasol controlled EO/EG Unit comes from the LIP JV controlled Ethylene 2 Unit. To better explain the production processes of the facility, Allyson stated that technology engineers of the units of interest would be able to guide us through the process flow diagrams of the units.

Lynette Cubero, ETO technical engineer, joined our meeting to explain the processes of the ETO units. She explained to us that the ETO units use EO/EG unit product for production of ethoxylates. After that brief explanation, Philip Zachary, EO/EG technical engineer, joined our meeting. He told us that the EO/EG Unit started production in April 2019, and that EO used to be shipped into the facility on railcars. After a lunch break, we continued our interview with Philip. He stated the EO unit is currently at approximately 87% unit utilization with a production of around 300,000 metric tons per year of total production, with 2/3rd being EO and 1/3rd being ethylene glycol ("EG"). He then explained to us the production process at the unit with the starting ingredients of ethylene and oxygen, where the ethylene is sourced from the LIP JV Ethylene 2 unit and that there was no storage of ethylene and oxygen at the unit, all raw material is used directly from the pipeline. Philip went on to explain that the EO production process at the EO/EG Unit takes place within a single reactor and wash tower, and that EO, water and CO_2 are the product from the reactor. From the wash tower, the rich cycle/EO rich stream goes to a stripping column then to an acid scrubber then to a reabsorber column then to a glycol feed stripper. At the glycol feed stripper, the product line splits such that a certain ratio of the EO goes to a glycol reactor to produce EG while the remaining EO goes to an EO purification column that produces EO product which is then stored in EO Storage Bullet tanks. Philip stated that there were three (3) EO Storage Bullet tanks, but only two (2) are actively being used for EO storage. At the reabsorber, a gaseous ethylene recovery stream, which can contain EO, is sent to a reclamation compressor which sends that stream back to the wash tower for circulatory processing. Philip stated that if the compressor trips at the reclamation compressor, the ethylene recovery stream is sent to the EO/EG flare for destruction. We were also told by Philip that samples are taken at the glycol reactor to determine whether there is EO contamination at the EG line in addition to using stoichiometric calculation to determine the full conversion to EG. From the glycol reactor, EG is sent to an evaporator train then to a drying column, which results in the dry EG. Philip went on to describe what happens to the stream from the knockout drum section of the wash tower. This stream, which is composed of methane and unreacted ethylene, is sent to a recycle compressor then to a waste heat boiler ("WHB") pot, and the liquid stream from this pot is sent to three (3) hot wells. Philip described each of the hot wells as follows: 1) the drying column hot well which sends liquid to drying column as reflux, 2) the evaporator hot well which goes to the vacuum effect that is part of the evaporator train but can also go to the recycle water tank that feeds process water into the reabsorber column or the acid scrubber as recycled water with process condensate, and 3) the Diethylene ("DEG")/Triethyelene ("TEG") Hot Well which is part of the dry EG glycol columns. Philip stated that hot well vapors normally route to the WHB, but if it is down, then the vapors are sent to carbon beds. We were then told by Philip that if the temperature and pressure indicated the presence of EO coming from the reabsorber, the gaseous stream is diverted from the reclaim compressor to the EO/EG Flare. We were told that this was part of an automated interlock system and that technicians check the distributed control system ("DCS") trends for activation and

length of flare diversions. Philip also stated that any sample taken to check for EO has a minimum detection limit of 1 ppm.

D. Au and I then spoke to Lynette about the Ethoxylation unit. She told us that the unit is composed of five (5) reactors, with three (3) in a legacy unit that receive EO from the EO Storage Bullet tanks and two (2) new reactors which receive EO directly from the EO/EG production loop. She also told us that EO can be loaded onto railcars for delivery to customers. Alcohol mixtures used in the ethoxylation process range from 6 carbon chain to 18 carbon chain with a result of over 100 different products that can be produced at the unit. Lynette stated that the alcohol mixtures come from the Ziegler Alcohol Unit or from offsite. We were told that all production at the ethoxylation reactor trains (which is the cumulative process equipment including the pretreatment vessel, the reactor, and the post treatment vessel) are batch processes.

Lynette described that the general ethoxylation reaction process begins when EO is added to the reaction, it starts off in liquid form and becomes gaseous as it reacts, the EO is added based upon measured vapor pressure where it reacts for approximately 30 minutes. After that period, a cooldown phase begins where acetic acid is added. Lynette stated that ETO Units 1, 2, and 3 can be routed to the VCU Ground Flare as the primary control device and to an Elevated Flare as a backup control device, while ETO 4 and 5 have a separate Elevated Flare as a control device. When a production campaign is complete, Sasol tests the products for purity. I requested sample results for September 2019, February 2020, and August 2021. We were then told that when there is displacing vapor space, gases are sent to the control devices, and if a batch produces an unwanted result, the first step is that Sasol will mix it in to other production batches. Between campaigns, there is an alcohol flush of the unit, and the resulting alochol mix is sent to a byproduct tank where it is sold. Lynette noted that facility staff can potentially determine when there is an issue with a batch if the feed-rate of the EO is slower than expected in the reactor. They also monitor temperature and pressure to detect whether there are issues and the EO feed is to be stopped. An indication of a runaway reaction results in a release to a control device, and we were told that the last runaway reaction was in 2015, and the release was sent to the VCU Ground Flare from the ETO 2 Train. We concluded the day's activities at 4:30 PM.

Field Inspection of EO/EG Unit, 02/01/2022

On February 1, 2022, D. Au and I returned to the facility at 8:00 AM to conduct a field inspection. We brought a Forward Looking Infrared ("FLIR") video camera to check for visual emissions within its detection spectrum. Matthew Todd met with me and D. Au at the main gate. We began our field inspection at the EO/EG Unit. We were joined by Cedric Duncan who is the facility's Leak Detection and Repair ("LDAR") specialist. He informed us that LDAR monitoring was conducted by contractor BrandSafway. We were also joined by Philip and Cory Burgin, who is a Process Support Specialist. At the EO/EG Unit, we requested to look at the Hot Wells, the Elevated Flare, Waste Heat Boiler, and the EO Storage Bullet Tanks. When we arrived at the EO/EG Unit, we were joined by Elaine Acord, Unit Manager, and Ricky Abate, Assistant Site Supervisor with BrandSafway. D. Au took photos (Appendix 1) while I had the FLIR Camera for observation and recording (no video was recorded). We were first led to the Waste Heat Boiler (Photo 1) and were told by Sasol staff that its firebox is equipped with three (3) thermocouples for temperature and an oxygen analyzer for airflow. We then moved on to the EG Rundown Tank which stores a day's worth of EG. Next, we went to the Evaporator Hot Well (Photo 2). We then moved to the Drying Column Hot Well (Photo 3) and then to the DEG/TEG Column Hot Well (Photo 4). I observed no vapors from the hot wells with the FLIR camera. Next, we visited the Catalytic Combustion Unit (Photo 5) and were told that the stack and catalyst were to be replaced in October 2022 due to hurricane damage. We then observed the EO Elevated Flare (Photo 6) and were told that it

was a steam assisted flare. We also had the EO Elevated Flare's Knockout Drum (Photo 7) pointed out for us. Our next stop was the EO Storage Bullet Tanks (Photo 8), where we observed the A, B, and C Tanks, and were told that the A and B Tanks were in service; B Tank was actively receiving EO from the EO production loop. Sasol staff explained to me and D. Au the safety systems of the Storage Bullet Tanks including a fire and gas sensor system which monitors lower explosive limit ("LEL")for fire prevention (Photo 9), and EO concentration in ppm. Sasol staff told us that the only time a deluge was triggered was due to a neighboring plastics plant having a runaway reaction event. This concluded our field inspection of the EO/EG Unit.

Discussion on ETO Unit Flares, 02/01/2022

We returned to the administrative building to meet with Lynette to discuss the ETO Units' emission control devices, specifically the flares. Lynette stated that ETO 1, 2, and 3 vent to the VCU Ground Flare primarily, and to the Elevated Flare in emergency situations. Lynette described the VCU Ground Flare as being a two-stage flare with two burners. The Elevated Flare was described to us as being equipped with steam assist and automated natural gas adjustment. If the pressure of gases sent to the VCU Ground Flare is high enough at the seal drum, the Elevated Flare can be used concurrently with the VCU Ground Flare. We were told that the VCU Ground Flare monitors for temperature with an automated interlock based upon three (3) temperature probes. Lynette also stated that there are three (3) pressure indicators on the seal drum. The design of VCU Ground Flare is equipped with air assist to the two burners with three (3) fans total with two for the burners and one to reduce the temperature for high temperature events. We were then told that the VCU Ground Flare was constructed in the mid-1990s. Lynette then stated that ETO Units 4, 5, and the Guerbet Alcohol Unit send waste gas to the ETO/Guerbet Elevated Flare (ETO-Q040-4030), which is a steam assisted flare. We were told this flare is equipped with automated natural gas and steam injection. It is also equipped with an infrared smoke monitor, pressure monitoring of the flare vents, and thermocouples for the temperature.

Field Inspection of ETO Unit, 02/01/2022

D. Au and I made entry to the ETO Unit with Megan Landry (ETO Unit Manager), Bo Couley (ETO Superintendent), and Richard Wagner (ETO Shift Supervisor). D. Au took photos with the digital camera (Appendix 1), and I observed the facility with the FLIR camera (no video recorded). We first inspected the ETO 1 reactor train and stopped at the PV-1030 Knockout Pot (Photo 10). D. Au was told that the gaseous vents of PV-1030 Knockout Pot and Viking Tower D-6703 go to the flare seal drum. We then moved to the PV-1000 EO Tank (Photo 11) and were told that it is filled from the EO Loop. The next location we inspected was the EO Loading Area where we saw the EO Break Tank (Photo 12), the EO Knockout Drum for purging rail cars (Photo 13), and the EO Rail Loading Area (Photos 14 and 15). D. Au was told that if EO is to be loaded onto rails cars, they are first purged prior to loading, where the vapors go to flare seal pot and liquids to the break tank. The EO Rail Loading Area has two offloading spots and two loading spots, and there was no active loading of EO to the rail cars when we visited. I climbed the stairs to the top of the scaffold and observed no emissions with the FLIR camera. Our next location we visited was the VCU ground flare and the ETO 1, 2, and 3 Elevated Flare (Photo 16), followed by the ETO 4/5 Guerbet Alcohol Elevated Flare (Photo 17) and the associated ETO 4/5 Knockout Tank (Photo 18) that is inline prior to the Combined Flare Knockout Tank (Photo 19). This concluded our field inspection of the ETO Unit.

Further Discussion of Air Emissions, 02/01/2022 – 02/02/2022

Upon return to the administrative building, D. Au and I discussed with Sasol staff the management of process wastewater from the EO/EG Unit. We were told that process wastewater from the Unit is sent

to WWTP2, which is owned by the LIP JV and managed by Lyondell Bassell staff. The wastewater sump pump goes to the WWTP2, which may include potentially contaminated stormwater ("PCS"), but not all PCS is given first flush treatment. The volatile organic chemical ("VOC") stripper vapors are sent to the EO/EG Elevated Flare, while the wastewater is sent to WWTP2. We were also told that neutralization sump pump also goes to WWTP2. Sasol staff stated that the pH of the process wastewater being sent to WWTP2 must be greater than 6 and less than 9 and have a chemical oxygen demand ("COD") of less than 2,500 ppm. D. Au and I requested air emission calculations for EO point sources submitted to the Louisiana Department of Environmental Quality as part of their annual emission inventory, which is uploaded to the Louisiana ERIC database. We also requested information for how the facility staff know when pressure relief devices ("PRD") relieve and need to be replaced or reset. We concluded for the day and returned in the morning, starting with a meeting with the LIP JV environmental staff to discuss their facility and its relationship with the Sasol Chemicals facility. Please see the inspection report of the LIP JV facility for additional details.

After D. Au and I concluded our meeting with the LIP JV staff, we reconvened with Sasol Chemical staff including Philip Zachary. We asked Philip about the liquids from the EO/EG Elevated Flare Knockout Drum, he stated that liquid samples from the Knockout Drum are analyzed for EO, mono-ethylene glycol (MEG), acid aldehyde, and formaldehyde. He said that if more than 1ppm of EO is detected in the EO/EG Flare Knockout Drum sample, it is not routed to the WWTP2, and that facility staff continue to sample the liquid until EO is no longer detected. When EO is detected, the standard protocol is to route it to the EO/EG Elevated Flare.

Cedric Duncan joined us to discuss the PRDs at the EO/EG Unit. He stated that the relief valves are set to a 400 pounds per square inch (PSI) relief pressure, that those PRDs which may have contact with EO are routed to a header system that feeds to the EO/EG Elevated Flare, some EO related PRDs are paired as both a rupture disc and a relief valve and that there is a pressure indicator located between the rupture disc and relief valve, and those that are not paired are monitored for pressure upstream. Lynette joined the group to discuss the PRDs at the ETO Unit. We were told that generally PRDs in VOC service are routed to associated flares depending on which ETO reactor train they are related to. PRDs tied to ETO product storage, feed tanks (non EO, alcohol), steam and catalyst release to atmosphere. We were told that there were no PRD alarms in ETO 1, 2, and 3 and that process upsets determine release, while ETO 4 and 5 PRDs in VOC service have pressure monitoring with alarms and are usually paired as rupture discs and relief valves.

Lynette then explained to us further the details regarding the flare usage at the ETO unit. The ETO 1, 2, and 3 Elevated Flare has steam media injection which is adjusted by the DCS board operator and is adjusted based on observed smoking of the flare. The ETO 4 and 5 Knockout Pot routes to the dirty byproduct tank (FB 8 and FB 9), which is then sold to customers. The Flare Knockout Pot drains to a liquid field tank and is also sold to customers. The ETO 1, 2 and 3 Knockout Pot routes to the Viking tower and liquids go to the byproduct tank. We were told that the contents of the byproduct tank are sold. The contents of the ETO 1, 2, and 3 seal drum are sent to the oily water sump, then to the Activated Sludge Unit ("ASU"), and then finally released at the Sasol Outfall 001.

At 10:30 AM on February 2, 2022, I conducted the exit briefing for part 1 of this inspection and the inspection team exited the facility at 10:50 AM.

Part 2 of Inspection (04/12/22 – 04/13/22)

On April 12, 2022, Myself, Doreen Au, and Andrew Mills of LDEQ made entry to the facility 8:15 AM. In addition to the main inspection team, EPA Region 6 inspectors Ben Rosenthal and James Haynes also

made entry to the facility as part of the Agency's Pollution Accountability Team (PAT) to conduct their own separate, parallel inspection. At 8:20 AM, all five inspectors held an opening conference with Sasol staff (see sign in sheet in Appendix 2). The PAT inspectors discussed the purpose of their inspection and the production units they wished to visit and left the meeting to conduct their inspection. D. Au, Andrew, and I then asked Sasol staff to describe their emission calculation systems. They stated that a software called ENABLON is used to calculate the potential to emit pollutants prior to the start of production for the EO/EG Unit and at ETO 4 & 5 reactor trains. After the completion of production, a reconciliation comparison between postproduction emission calculations and potential to emit calculations is done at the end of each month. Sasol stated that ENABLON was originally created by Scott Shaw with the assistance of consultants and is currently managed by a 3rd party consultant called Golder. For the older ETO 1, 2, and 3 reactor trains, emission calculations are done using an AIMS database. It was also noted by Sasol staff that any type of change to either ENABLON or AIMS variables requires a Management of Change ("MOC") procedure. Philip Zachary stated that he conducts the monthly ENABLON reconciliation of emissions at approximately the middle of the following month (i.e., March reconciliation done in mid-April).

Lynette, of the ETO Unit, then joined our meeting. I asked her about the ETO 1, 2, and 3 flaring emissions in the year 2020. I had observed increased flare related emissions when reviewing documents provided in response to our part 1 inspection. She stated that a hurricane caused the VCU Ground Flare to go down and offline in August of 2020. What would have been normally routed to the VCU went to the ETO 1, 2, and 3 Elevated Flare during the repair period of the VCU. Lynette stated that the destruction efficiency of the Elevated Flare was 98% while the VCU is over 99%, which they claimed could potentially account for the increased emissions during that period. Production data for the emission calculations comes from an SAP database.

Philip then presented his ENABLON entry process. He showed us that he creates two different spreadsheets, one for his own personal reference of production data, and the second being a directly imported sheet into ENABLON for processing of emission calculations. The direct input to ENABLON are values in pounds per hour per month of VOCs being sent to a control device. Hours of flow per variable which are input into ENABLON are largely determined by operator choice. Philip also showed that he can manually input values into the ENABLON system, but his regular protocol is to use a software macro to import data from an electronic spreadsheet into the system.

Lynette then stated that she is responsible for inputting data into the AIMS software for emission calculations at ETO 1, 2, and 3 reactor trains and inputting data into ENABLON for ETO 4 & 5 reactor trains. Inputs into the emission calculation softwares is by production batches per reactor for the month. The variables for ENABLON data entry other than production batch counts are gathered from Process Information Management System ("PIMS") and the batch counts come from historian software.

Scott Shaw, the facility's lead for emissions reporting, joined me, D. Au, and Andrew Mills to discuss the AIMS emission calculation software. He stated that AIMS is a Microsoft Access Database software that he created in conjunction with a consultant. PIMS and historic DCS data are used for emission calculations in AIMS. Scott stated that when new instrumentation is installed as part of the related process and emission control systems, he is alerted as part of an MOC procedure and modifies AIMS or ENABLON to incorporate the effect upon emission calculations. We were told that engineers will review the automated PIMS values to determine their viability and that a third-party consultant makes modifications to ENABLON, and Scott Shaw reviews that work.

I requested that Scott show us the user interface of AIMS and any calculation mechanisms that can be observed. He pulled up the software and demonstrated to us the system. He showed us that the AIMS system assumes a worst-case scenario for emissions except in the case of EG batch products and butanol free alcohol being used in production. He stated that the ETO unit has over 300 potential product recipes, but for the purposes of calculating emissions, the differentiation of calculation for EG products is based on alcohol type being used in production. Upon review post-inspection of the AIMS calculation files, emission calculations for EG batch products are dependent on the carbon chain length of alcohol for the batch, ranging from 6, 8, 10, or 12+ carbons chained.

I then requested to look at the ENABLON user interface and any calculation mechanisms that can be observed. I noted that ENABLON is a far more closed software as opposed to AIMS as AIMS is built in Microsoft Access which allows for equations to be more readily opened and modified. Scott stated that to spot check emission calculations, he will pull a ENABLON calculated value and attempt to do the same calculation manually to see if he can arrive at the same output value. For EO/EG Unit calculations that are related to emission control devices (i.e., the waste steam boiler, the Elevated Flare, etc.), the calculation covers an entire operational period rather than the actual length for which the waste vent stream is sent to the device. As an example, if the EO/EG Elevated Flare was used in reality for 24 hours during an operational period, the ENABLON emission calculation will take the cumulative amount of flow for that period and spread it across the entire operational period.

D. Au and I then asked to discuss wastewater emission within Sasol's control. ETO 1, 2, & 3 send their wastewater to the Sasol controlled ASU, where the wastewater is treated with aerobic biologic treatment. Sasol staff noted that they classified the wastewater in three categories, non-contaminated stormwater, first flush wastewater, and process wastewater. The non-contaminated stormwater is sent to the stormwater diversion pond, where it eventually is sent out a regular outfall. The first flush wastewater is sent to a holding pond, and then to the ASU. Process wastewater is also sent to the holding pond, and then to the ASU. ETO 4 & 5 reactor trains and the EO/EG Unit send wastewater to the LIP JV controlled Wastewater Treatment Plant. We were told that the EO/EG Unit is designed as a closed loop for EO, but wastewater is not specifically screened for EO content, but rather is sampled for COD and pH. It was also stated that ETO 4 & 5 reactor train wastewater isn't sampled for EO unless requested by LIP JV.

On April 13, D. Au and I spoke to Elaine Acord, Unit Manager of the EO/EG Unit about wastewater from that unit. She stated that the EO/EG wastewater that is sent to the LIP JV WWTP2 is currently being throttled based on a COD limit of pounds per day. She explained that a lower COD, based upon sampling results, would allow more water to be sent to WWTP2, and a lesser amount of water if a higher COD was sampled. We then spoke to Megan Landry, Unit Manager for the ETO Unit. She stated that ETO 4 & 5 reactor trains and the Guerbet Alcohol Unit share a pipeline that sends wastewater to the LIP JV WWTP2. Megan confirmed that COD sampling on this wastewater line is done on request by LIP JV staff, and that the combined line flow has the potential to be throttled but is not currently done. She stated that the EO/EG Unit wastewater line is more challenging in its management because EG is much more demanding of oxygen, potentially raising the COD of the wastewater sent to WWTP2. This concluded the second part of the in-person inspection of the facility.

Section III – AREAS OF CONCERN

I observed no areas of concern at the time of inspection. In post inspection analysis, it is an area of concern regarding the reporting of emissions for the ETO loading racks. From 2018 to 2020, all loading rack emissions were reported under the permitted equipment of EQT 1103, but EQT 1103 is supposed to

be representative of the loading racks servicing ETO reactor trains 4 and 5, while the loading racks of ETO reaction trains 1, 2, and 3 are serviced by equipment permitted as EQT 0454, 456, and 457. Reporting of emissions should be associated with the correct permitted equipment so there is no confusion from where emissions are generated.

I recommend that emissions calculated with the ENABLON software have external calculations that are routinely used to check and reconcile software calculations so that emissions reported are understandable and accountable.

Section IV – FOLLOW UP

After the in-person inspection took place, I conducted a review of documentation requested during the inspection that was provided from Sasol, including AIMS and ENABLON emission calculation spreadsheets and documents. Upon review, I requested electronic spreadsheet versions of the AIMS emission calculations as the original documents were not in spreadsheet format and cell linkages could not be reviewed. Those documents were provided by Sasol staff.

I had a question regarding EO sampling results at the ETO Unit in September 2019 where product samples showed increased EO in the samples taken at that time. Allyson Leger provided a response from the unit engineer that the product samples were off specification and recirculated back to the ETO reactor to be purged with nitrogen to reduce the EO content to less than 1 ppm prior to being shipped out, which I confirmed by reviewing the documentation.

I had a question regarding annual emissions reporting for the ETO Loading racks. There were EO emissions reported from a EQT 1103 Loading Rack, but EQT 1103 has no EO emission limits per the most recent Title V Permit. Different loading rack equipment titled from EQT 0454 to EQT 0457 and grouped as GRP0000000050 in the Title V permit do have EO emission limits. It was clarified by Sasol permitting specialist Tracy Jenny that EQT 1103 is loading operations for ETO reactor trains 4 and 5 while GRP0000000050 is loading operations for ETO reactor trains 1, 2, and 3. I sought additional clarification on why the ERIC annual emission reporting from 2018 to 2020 included EO emissions for EQT 1103 but not for GRP0000000050 despite loading of same product slates. Tracy's response was that reporting of all loading rack emissions, regardless of association with ETO 1, 2, 3 or ETO 4, 5, were all reported under EQT 1103 (EQT 1103 did not begin operation until 2020). Additionally, Tracy stated that Sasol has submitted modifications to their permit such that all loading racks have the equivalent emission limits on EO and other hazardous air pollutants.

Section V – LIST OF APPENDICES

Appendix 1 – Photo Log – 19 photos taken 01/31/2022 – 02/01/2022
Appendix 2 – Opening and closing conference sign-in sheets

Appendix 1

Photograph Log

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 1

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

Waste Heat Boiler. Actual photo time was 02/01/2022 at 08:52AM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 2

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

Evaporator Hot Well. Actual photo time was 02/01/2022 at 09:06AM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 3

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

Drying Column Hotwell. Actual photo time was 02/01/2022 at 09:12AM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 4

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

Deg/Teg Columns Hotwell. Actual photo time was 02/01/2022 at 09:18AM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 5

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

Catalytic Combustion Unit. Actual photo time was 02/01/2022 at 09:32AM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 6

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

EO Elevated Flare. Actual photo time was 02/01/2022 at 09:44AM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 7

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 8

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

EO Bullet Storage Tanks. Actual photo time was 02/01/2022 at 09:56AM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 9

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

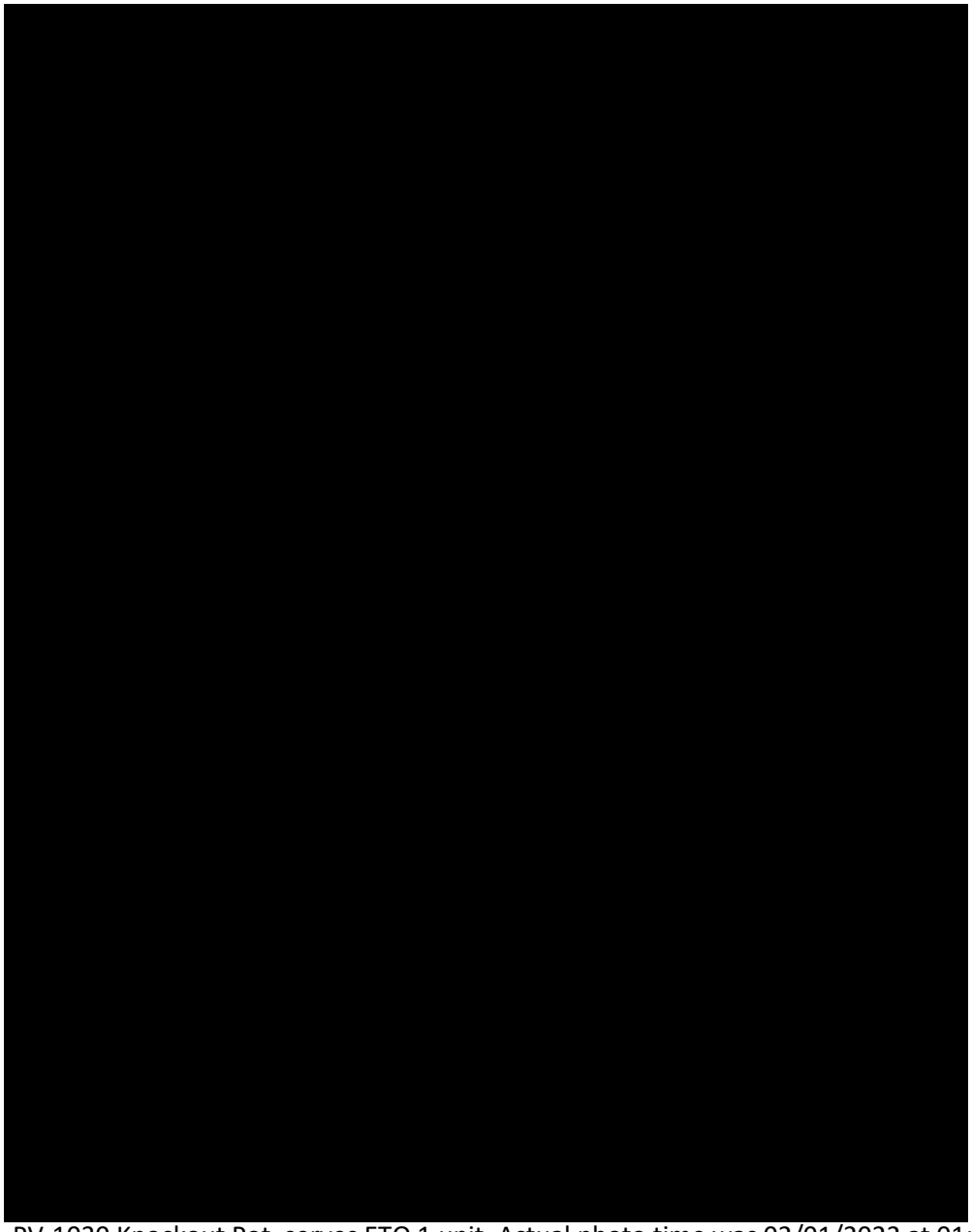
Fire and Gas System Sensor. Actual photo time was 02/01/2022 at 10:07AM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 10

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana



PV-1030 Knockout Pot, serves ETO 1 unit. Actual photo time was 02/01/2022 at 01:59PM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 11

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

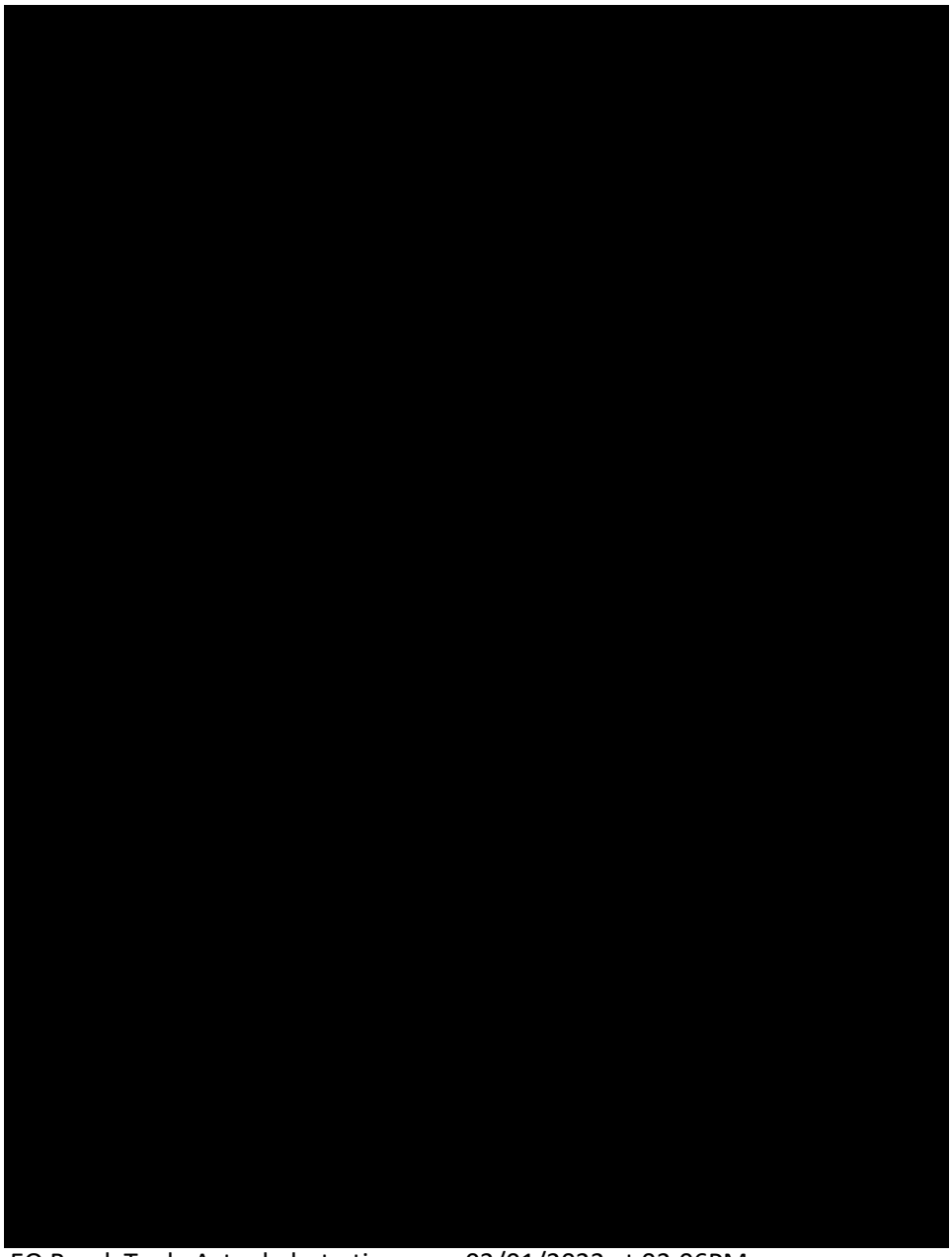
PV-1000 EO Tank, served by the EO Loop. Actual photo time was 02/01/2022 at 02:02PM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 12

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana



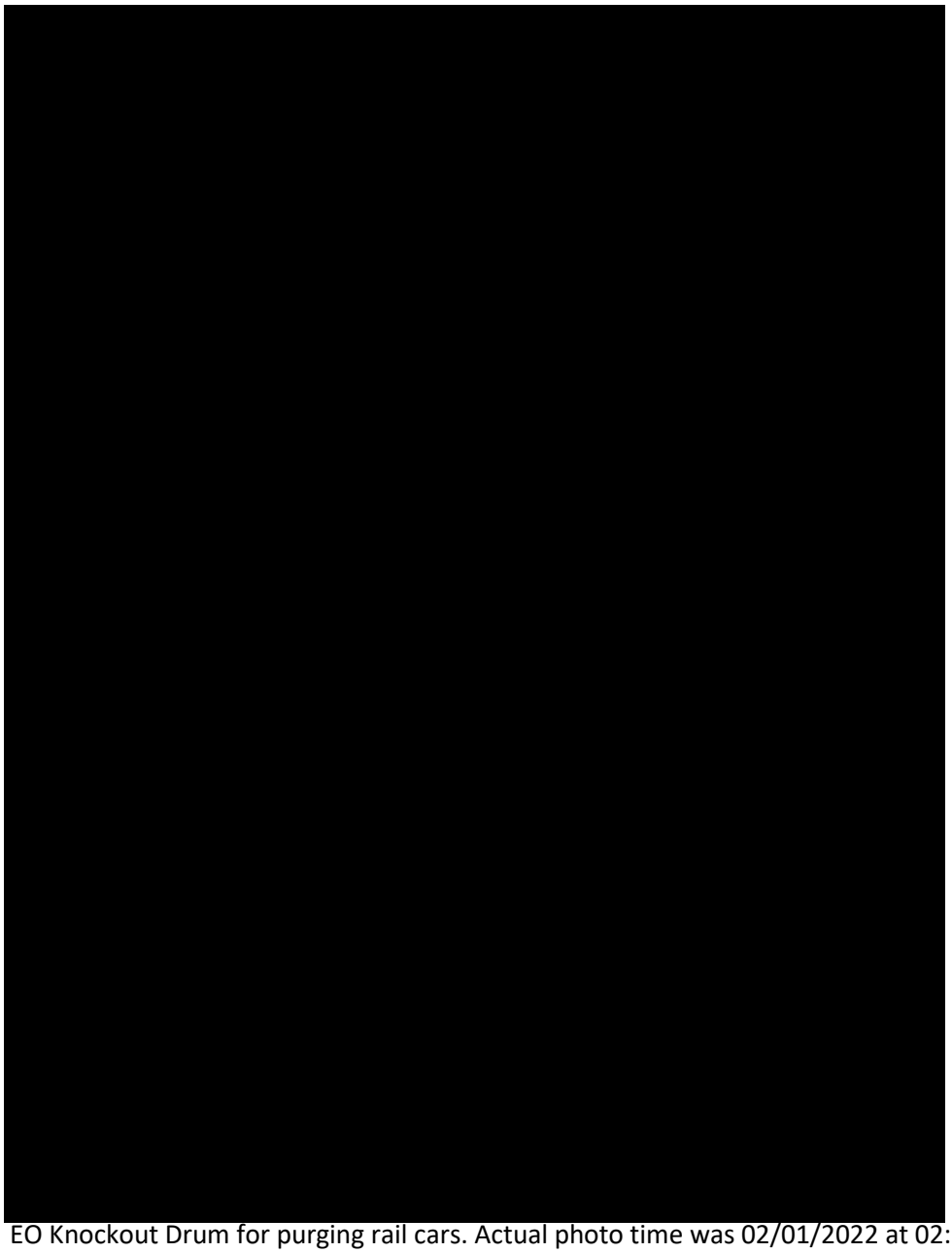
EO Break Tank. Actual photo time was 02/01/2022 at 02:06PM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 13

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana



EO Knockout Drum for purging rail cars. Actual photo time was 02/01/2022 at 02:12PM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 14

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

EO Rail Loading Area with railcars. Actual photo time was 02/01/2022 at 02:14PM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 15

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

EO Rail Loading Area with railcars. Actual photo time was 02/01/2022 at 02:14PM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 16

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

ETO 1, 2, & 3 VCU Ground Flare and Elevated Flare. Actual photo time was 02/01/2022 at 02:24PM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 17

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

ETO 4 & 5 Elevated Flare. Actual photo time was 02/01/2022 at 02:43PM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 18

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

ETO 4/5 Knockout Tank prior to Flare Knockout. Actual photo time was 02/01/2022 at 02:53PM.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 19

Location: Sasol Chemicals Sasol Chemicals Lake Charles Chemical Complex		
City: Westlake	County/Parish: Calcasieu	State: Louisiana

Combined Flare Knockout Tank. Actual photo time was 02/01/2022 at 03:04PM.

Appendix 2

Opening and closing conference sign-in sheets

Opening/Pre-Inspection Meeting

Commence opening/pre-inspection meeting ..... Time: 925

Name	Title	Representing	Telephone No.
Allyson Leger	Env. Manager	Sasol	337 936 2347
Matthew Todd	Env. Specialist	Sasol	337 494-5077

Conclude opening/pre-inspection meeting ..... Time: _____

Initials / Date: JC / 1/31/22

Exit interview / Out-briefing Meeting

Commenced meeting..... Time: 1030

Name	Title	Representing	Telephone No.
Justin Chen	Env. Engineer	EPA	214 665 2273
Doreen Au	Sup. Chemist	EPA	303 462 9266
Lynnette M. Gubero	Process Engineer	Sasol	337-310-1654
Allyson Leger	Env Manager	Sasol	337-494-5087
Matthew Todd	Env. Specialist	Sasol	337-494-5079
Philip Zachary	Process Engineer	Sasol	337-494-5157
Pieter Potgieter	VP, SHE & Risk	Sasol	713 8824444

Conclude meeting..... Time: 1050

Initials / Date: JC / 2/2/22

Opening/Pre-Inspection Meeting

Commence opening/pre-inspection meeting ..... Time: 820

Name	Title	Representing	Telephone No.
Justin Chen	Inspector	EPA RC	214 665 2273
Ben Rosenthal	Inspector	EPA R6	214665 6453
James Haynes	Physical Scientist	EPA R6	214-665-8546
Andrew Mills	Inspector	LDEQ	337-491-2667
Matthew Todd	Sasol	Sasol	337-526-0111
Allyson Leger	Sasol / Env Mgr	Sasol	337-494-5087
Philip Zachary	EOEG Engineer	Sasol	494-5157
Dorcen Au	Inspector ~~EPA-NEIC~~ DW	EPA-NEIC	303 462 9266

Conclude opening/pre-inspection meeting ..... Time: 915

Initials / Date: JAC / 4/12/22